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EXAMINER WONG, XAVIER S				
ART UNIT		PAPER NUMBER		
2416				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/648,447

Applicant(s)

BRAUN ET AL.

Examiner

Xavier Szewai Wong

Art Unit

2416

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13th April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-11 and 14-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-11,14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Pending: claims **1, 2, 4 – 11** and **14 – 20**

Response to Arguments

Applicant's arguments filed 13th April 2009 regarding claims **1, 5, 6** and **10**, as amended, have been fully considered but they are moot in view of new rejection grounds. Applicants are directed to European Patent **EP 1404065 B1** for further referencing and consideration.

Claim Objections

Claim 5 is objected to because of the following informalities: line 2, delete phrase "adapted to" since the phrase *lacks positive limitation* and is considered as an *optional language*. USPTO personnel are to correlate each claim limitation to all portions of the disclosure that describe the claim limitation. This is to be done in all cases, regardless of whether the claimed invention is defined using means or step plus function language. The correlation step will ensure that USPTO personnel correctly interpret each claim limitation. The subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation. The following are examples of language that may raise a question as to the limiting effect of the language in a claim:

- (A) statements of intended use or field of use,
- (B) "adapted to" or "adapted for" clauses,
- (C) "wherein" clauses, or
- (D) "whereby" clauses.

This list of examples is not intended to be exhaustive. See also MPEP § 2111.04.

Disclosure may be express, implicit, or inherent. Thus, at the outset, USPTO personnel must attempt to correlate claimed means to elements set forth in the written description that perform the recited step or function. The written description includes the original specification and the drawings and USPTO personnel are to give the claimed means plus function limitations their broadest reasonable interpretation consistent with all corresponding structures or materials described in the specification and their equivalents including the manner in which the claimed functions are performed. See *Kemco Sales, Inc. v. Control Papers Company, Inc.*, 208 F.3d 1352, 54 USPQ2d 1308

(Fed. Cir. 2000). Further guidance in interpreting the scope of equivalents is provided in MPEP § 2181 through § 2186. While it is appropriate to use the specification to determine what applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not itself impose that limitation. A broad interpretation of a claim by USPTO personnel will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant can always amend a claim during prosecution to better reflect the intended scope of the claim.

Claim 9: the "n" carrier frequencies should be clarified as, *for example*, $n \geq 1$.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 4, 5, 6, 9, 10, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahlman et al (US 2002/0145988 A1, Dahlman) in view of Walton et al (US 2006/0121946 A1, Walton) and in further view of Kanemoto et al (US 6928296 B2, Kanemoto).

Claims 1, 5 and 6: **Dahlman** et al show in figure 3 a base station comprising computer program product having program means for sending a plurality of first signals and a plurality of second signals to a plurality of user equipments, the program performing steps of: providing a transmitter with a plurality of power amplifiers and a plurality of antennas (fig. 9: dedicated channel controller 20, shared data channel controller 22 and transmit power controller 16), each of the plurality of power amplifiers being a multi-carrier amplifier supporting amplification of a first carrier frequency and also a second carrier frequency ([0033] lines 11-17 and 31-34: signaling in dedicated and shared channels); providing a dedicated channel for each one of the plurality of user equipments ([0007] lines 17-20); assigning (allocating) a carrier frequency of a set of at least first and second carrier frequencies ($f_{DL,1}$ $f_{DL,2}$) to each of the dedicated channels ([0008] lines 1-9); providing a code-multiplexed shared channel for the plurality of user equipments ([0007] lines 20-23). Yet, sending one of the first signals to one of the plurality of user equipments on the dedicated channel of that user equipment on the assigned carrier frequency by a transmit diversity scheme; and sending one of the second signals to one of the plurality of user equipments on the code-multiplexed shared channel on a carrier frequency assigned to that user equipment by multi-user diversity scheme, are not *very specifically* mentioned by **Dahlman** et al. **Walton** et al disclose a base station performing transmit diversity scheme for downlink ([0066]); as well as performing multi-user diversity scheme using a scheduler to identify spatial signatures (frequencies) and antenna assignments in the base station ([0323], [0396-400]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the

transmit diversity scheme and multi-user diversity scheme of **Walton** et al to the first and second carrier frequencies assigned in the base station of **Dahlman** et al to maximize throughput.

Dahlman, in combination with **Walton**, do not very particularly mention "for each dedicated channel, assigning only one carrier frequency of a set of carrier frequency comprising at least a first carrier frequency and a second carrier frequency wherein some of the plurality of dedicated channels are assigned to the first carrier frequency and others of the plurality of dedicated channels are assigned to the second carrier frequency" and "the first signals are sent by the transmitter on the dedicated channel provided for the given UE on only the assigned one of the plurality of carrier frequencies using one of the plurality of power amplifiers" and "the second signals are sent by the transmitter on the dedicated channel provided for the given one UE on only the assigned one of the plurality of carrier frequencies using one of the plurality of power amplifiers."

Kanemoto teaches for each dedicated channel, assigning only one carrier frequency of a set of carrier frequency comprising at least a first carrier frequency and a second carrier frequency wherein some of the plurality of dedicated channels are assigned to the first carrier frequency (col. 10 lines 60-65: MS#1 ~ MS#n dedicated channels) and others of the plurality of dedicated channels are assigned to the second carrier frequency (col. 10 lines 44-50: DSCH shared channel using terminals) and the first signals are sent by the transmitter on the dedicated channel provided for the given UE on only the assigned one of the plurality of carrier frequencies using one of the plurality

of power amplifiers (fig. 10: each MS has its own dedicated channel power control – see the plurality of “Number of MS’S” blocks – with *each MS having its own carrier frequency*) and the second signals are sent by the transmitter on the shared channel provided for the given one UE on only the assigned one of the plurality of carrier frequencies using one of the plurality of power amplifiers (fig. 10: each MS has its own DSCH (shared) power control – see the plurality of “Number of MS’S” blocks – with *each MS having its own carrier frequency*). It would have been obvious to one of ordinary skill in the art when the invention was created to modify the transmission scheme of **Dahlman**, in combination with **Walton**, to implement the structure of **Kanemoto** to reduce difference between dedicated channel signal transmission power value and shared channel signal transmission power value through timing adjustment and serving each UE with its individual channel.

Claims 4 and 9, applied to claims 1 and 6: **Dahlman** et al, as modified by **Walton** et al, further disclose the set of carrier frequencies having a number of n carrier frequencies, wherein n may be any non-negative integers ($\{0008\}; f_{DL,1} f_{DL,2}$).

Claims 6 and 10: Referring to claims 1 and 5, **Dahlman** et al, as modified by **Walton** et al, disclose the claimed invention yet not *specifically* first, second, third, fourth or fifth separate components to perform the steps mentioned in claims 1 and 5. Nonetheless, the examiner takes official notice that it would have been a matter of design choice to perform the five steps in five separate components as a known option within his or her technical grasp to provide both transmit diversity and multi-user diversity schemes.

Claim 14: **Dahlman**, in combination with **Walton**, discloses each one of the plurality of user equipment is assigned to a first transmission carrier frequency ($f_{DL,1}$) or a second transmission frequency ($f_{DL,2}$) [0008].

Claim 17: **Dahlman**, in combination with **Walton**, teaches the first signals correspond to real-time signals and the second signals correspond to non-real time signals ([0008] lines 12-14: $f_{DL,1}$ is speech = real-time; while $f_{DL,2}$ is data = non-real time).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman et al (US 2002/0145988 A1)** in view of **Walton et al (US 2006/0121946 A1)**, applied to claim 1, and in further view of **Chang et al (US 2002/0136193 A1)**.

Claim 2, applied to claim 1: **Dahlman et al**, modified by **Walton et al**, disclose the claimed invention yet do not *specifically* mention the dedicated channel type as DSCH-type, and the code-multiplexed shared channel is HS-DSCH type channel of a HSDPA type transmission system. **Chang et al** disclose a DSCH channel as a dedicated channel assigned to each UE ([0029] lines 17-20), and an HS-DSCH channel for transmitting HSDPA service data ([0029] lines 11-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the shared control channel and dedicated channel to use HS-DSCH and DSCH as taught by **Chang et al**, to the base station of **Dahlman et al**, as modified by **Walton et al**, to better control transmission power upon a cell change.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman et al (US 2002/0145988 A1)** in view of **Walton et al (US 2006/0121946 A1)**, applied to claims 1 and 6, and in further view of **Argaman et al (US 2006/0052065 A1)**.

Claims 3 and 8, applied to claims 1 and 6: **Dahlman et al**, as modified by **Walton et al**, disclose the claimed invention (**Walton et al** disclose a component that sends signals in transmit diversity scheme) except do not *specifically* mention performing sending of the first and second signals by means of first and second MCPAs being coupled to first and second antennas, the first and second MCPAs having at least the first and second frequencies. **Argaman et al** show in figure 8 a base transceiver station comprising MCPA 85 and MCPA 86 are coupled to a first antenna 83 and a second antenna 84 respectively, wherein the MCPA 85 and MCPA 86 each may carry 3 (at least two) CDMA carriers ([0140]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the MCPA and antenna structure of **Argaman et al**, to the base station of **Dahlman et al**, as modified by **Walton et al**, for transmit diversity.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman et al (US 2002/0145988 A1)** in view of **Walton et al (US 2006/0121946 A1)**, applied to claim 6, and in further view of **Isokangas et al (US 2004/0213297 A1)**.

Claim 7, applied to claim 6: **Dahlman et al**, as modified by **Walton et al**, disclose the claimed invention except do not *specifically* mention the scheduler sending the second signals only when a constructive channel fade is detected. **Isokangas et al**

clearly teach a scheduler that exploits multi-user diversity by scheduling only those users in constructive fades in shared HS-DSCH ([0008]). It would have been obvious to one of ordinary skill in the art at the time the invention was created to modify the scheduler of **Dahlman** et al, as modified by **Walton** et al, to send signals only when a constructive channel fade is detected as taught by **Isokangas** et al, to better match current channel conditions.

Claims 11, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman** et al (US 2002/0145988 A1) in view of **Walton** et al (US 2006/0121946 A1) and **Kanemoto** et al (US 6,928,296 B2, **Kanemoto**), applied to claims 1 and 12, and in further view of **Mimura** (US 6,021,123).

Claims 11, 12 and 13, applied to claims 1 and 12: **Dahlman** et al, as modified by **Walton** et al and **Kanemoto** et al, disclose the claimed invention yet do not *specifically* mention each one of the plurality of UEs are split into a first group of UEs and a second group of UEs wherein the first group of UEs are assigned to the first carrier frequencies and the second group of UEs are assigned to the second frequencies. **Mimura** teaches a CDMA cellular system that divides frequencies into a first group and a second group, wherein the first group of frequencies are assigned to base stations_{1-n} and the second group of frequencies are assigned to base stations_{a-c} wherein a mobile station is assigned to the first group of frequencies (abstract), and further the mobile station may be assigned to the second group of frequencies based on rate of use (abstract; fig. 13 wherein first group $f_{01}, f_{02} \rightarrow$ handoff \rightarrow second group f_{11-13}). Therefore, if there are multiple mobile stations wherein one group of mobiles have high use rate while the other group

of mobiles have low use rate, the high use rate mobiles would be assigned to the first group of frequencies while the low use rate mobiles would be assigned to the second group of frequencies (col. 12 lines 57-67; col. 13 lines 1-8). It would have been obvious to one of ordinary skill in the art at the time the invention was created to apply the CDMA frequencies and group assignment technique of **Mimura** to the base station of **Dahlman** et al, as modified by **Walton** et al, to allow smoother handoffs.

Claims 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman** et al (**US 2002/0145988 A1**) in view of **Walton** et al (**US 2006/0121946 A1**) and **Mimura** (**US 6,021,123**), applied to claims **14** and **12**, and in further view of **Yun** et al (**US 5,886,988**).

Claim 16: **Dahlman**, in combination with **Walton** and **Mimura**, discloses assignments of the first and second transmission frequencies yet not specifically "in order to balance load of power amplifiers." **Yun** teaches assignments of the first and second transmission frequencies in order to balance load of power amplifiers (col. 8 lines 43-47: multi-carrier power amplifiers... col. 22 lines 38-49: load threshold and monitoring). It would have been obvious to one of ordinary skill in the art when the invention was created to balance the load of the amplifiers as taught by **Yun** to the system and method of **Dahlman**, in combination with **Walton** and **Mimura**, to avoid power overload.

Claim 19: **Dahlman**, in combination with **Walton** and **Mimura**, discloses second signals sent to the first group of UEs yet not specifically "a first and second multi-carrier power amplifier (MCPA) to amplify the signals to the first group UEs." **Yun** teaches a *concept* of using multi-carrier amplifier to amplify signals to group of UEs (col. 8 lines 43-

47: MCPA ... group of subcarriers). It would have been obvious to one of ordinary skill in the art when the invention was created to utilize a first and second multi-carrier power amplifier to amplify the signals to the first group UEs as taught by **Yun** to the system and method of **Dahlman**, in combination with **Walton** and **Mimura**, for load balancing of amplifiers.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman et al (US 2002/0145988 A1)** in view of **Walton et al (US 2006/0121946 A1)**, applied to claim 14, and in further view of **Dent (US 2001/0012280 A1)**.

Claim 18: **Dahlman**, in combination with **Walton**, discloses the first and second transmission frequencies yet does not very specifically discuss they are assigned *dynamically*. **Dent** teaches discuss the assignment of the first and second transmission frequencies is *dynamic* [0021: Each of the frequency allocation systems for a TDMA time slot may include a fixed frequency reuse system or an adaptive channel allocation system for *dynamically adjusting the frequency allocation* in response to changes in *loading* or other system parameters]. It would have been obvious to one of ordinary skill in the art when the invention was created to implement dynamic frequency assignment as taught by **Dent** to the system and method of **Dahlman**, in combination with **Walton**, for load balancing.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Dahlman et al (US 2002/0145988 A1)** in view of **Walton et al (US 2006/0121946 A1)**, applied to claim 1, and in further view of **Isokangas et al (US 2004/0213297 A1)** and **Katz (US 6,763,237 B1)**.

Claim 20: **Dahlman** et al, modified by **Walton** et al, disclose scheduling of second signals to be sent over the code-multiplexed shared channel in order to provide multi-user diversity (**Walton** et al disclose a base station performing transmit diversity scheme for downlink [0066]; as well as performing multi-user diversity scheme using a scheduler to identify spatial signatures (frequencies) and antenna assignments in the base station in [0323] and [0396-400]); yet do not *specifically* mention scheduling only the plurality of second signals to the UEs in constructive fades. **Isokangas** et al teach a scheduler that exploits multi-user diversity by scheduling only the plurality of second signals to the UEs in constructive fades ([0008] scheduling only those users in constructive fades in shared HS-DSCH). It would have been obvious to one of ordinary skill in the art at the time the invention was created to modify the scheduler of **Dahlman** et al, as modified by **Walton** et al, to send signals only when a constructive channel fade is detected as taught by **Isokangas** et al, to better match current channel conditions. Yet, it is not specifically taught that "whereby [first and second] power amplifiers are used for sending of the plurality of [first] signals and the plurality of [second] signals, and scheduling the [second] plurality of signals is performed such that usage of the [first and second] power amplifiers is statistically balanced." **Katz** teaches a *concept* of [first and second] power amplifiers are used for sending of the plurality of [first] signals and the plurality of [second] signals, and scheduling the [second] plurality of signals is performed such that usage of the [first and second] power amplifiers is statistically balanced (col. 6 lines 26-34: power amplifiers power loading equally balanced ... col. 14 lines 52-58: signals... multiplexed with respect to frequency). It would have been obvious to one of ordinary skill in the art when the invention was created to implement power amplifier load balancing

for signal sending as taught by **Katz** to the system and method of **Dahlman** et al, as modified by **Walton** et al and **Isokangas** et al, to avoid overloading one of the amplifiers.

Allowable Subject Matter

Claim 15: **Dahlman**, in combination with **Walton** and **Kanemoto** et al, discloses the first and second transmission carrier frequencies wherein *re-use* is taught yet not specifically "assigning first and second transmission frequencies in an alternating way, wherein when a UE becomes active the first carrier frequency is assigned to the UE, and when a next UE becomes active the second carrier frequency is assigned to the next UE."

The best prior arts of record do not very particular mention the above feature, thus, claim 15 is deemed to be non-obvious over prior arts of record.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xavier Wong whose telephone number is 571.270.1780. The examiner can normally be reached on Monday through Friday 8:30 am - 6:00 pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571.272.3174. The fax phone number for the organization where this application or proceeding is assigned is 571.273.8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866.217.9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571.272.1000.

/Xavier Szewai Wong/
x.s.w
19th July 2009

/Kevin C. Harper/

Primary Examiner, Art Unit 2416